EE 5388 Lasers (3-0)

Spring 2016 T/Th 2:00pm - 3:20pm TBD

Instructor: Dr. Weidong Zhou
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Required Textbook:
J. T. Verdeyen, "Laser Electronics," 3rd edition, Prentice Hall, 2000.

Reference books:

1. P. Bhattacharya, Semiconductor Optoelectronic Devices (2nd Edition, Prentice Hall, 1997)
2. L. A. Coldren and S. W. Corzine, Diode Lasers and Photonic Integrated Circuits, (Wiley, 1995)
3. MIT Open Courseware: http://ocw.mit.edu/resources/res-6-006-video-demonstrations-in-lasers-and-optics-spring-2008/demonstrations-in-laser-fundamentals/

Course Description: Propagation of optical rays and waves, Gaussian laser beams, laser cavities and resonators, laser amplifiers, lasing and population inversion, laser dynamics, semiconductor lasers, vertical-cavity surface-emitting lasers, and applications of lasers. Recent research trends and new development on membrane lasers, nanolasers, and 2D lasers will be highlighted as well.

Course Learning Goals/Objectives: This course is designed to give graduate and undergraduate students an understanding of principles and applications of lasers.

Tentative lecture Topics:

1. Review of electromagnetic theory
2. Ray optics and Gaussian beams
3. Optical cavities and resonators, transverse and longitudinal cavity modes
4. Spontaneous emission and stimulated emission, population inversion
5. Optical materials and gain medium (gas, solid state, and semiconductors)
6. Semiconductor lasers, quantum well and dot lasers, DFB lasers, VCSELs
7. Laser dynamics and high speed modulations
8. Laser applications in communications, computing, sensing, bio-medical imaging, etc.

Course Requirements and Grading:

- Homework and quiz (10%): Assigned
- Midterm: (30%)
- Final: (40%)
- Term paper: (20%)

Grading Scale:

A (>=85%); B (>=70% to <85%); C (>=60% to <70%); D (>=50% to <60%); F (<50%).

Class Attendance and Drop Policy: Attendance is required. Students are responsible for all materials covered in class. Drop policy: As per University guidelines. See the Registrar's Bulletin or the University Calendar in the front part of the UTA catalog for drop dates.

Academic Dishonesty
It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University.
"Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, and the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts." (Regents' Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22)

Americans With Disabilities Act

The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 93112 -- The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans with Disabilities Act - (ADA), pursuant to section 504 of The Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

As a faculty member, I am required by law to provide **"reasonable accommodation"** to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with **informing faculty at the beginning of the semester and in providing authorized documentation through designated administrative channels.**

Student Support Services Available

The University of Texas at Arlington supports a variety of student success programs to help you connect with the University and achieve academic success. These programs include learning assistance, developmental education, advising and mentoring, admission and transition, and federally funded programs. Students requiring assistance academically, personally, or socially should contact the Office of Student Success Programs at 817-272-6107 for more information and appropriate referrals.